Space Weather Forecast

Issued on Wednesday, 14 August 2024 at 13:26 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate class flares expected, a chance of Strong class flares. A chance of Minor Solar Radiation storming.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been High with three Moderate class flares and a single Strong class flare observed in the past 24 hours, the latter of which peaked at 14/0641 UTC originating from the large spot in north-centre disk. This spot is now the largest and most active region, with the leading and trailing portions connected to the large compact central spot, therefore containing numerous delta spots in a somewhat unusual configuration, with significant magnetic complexity. The only other spot of note is a large spot in the southwest, it retains a complex magnetic structure with at least one delta spot around the large and compact central spot. All other spots are currently small and simple.

A halo coronal mass ejection is beginning to be observed, originating near centre disk associated with the Strong class flare from the north-centre around 14/0641 UTC. Analysis of this feature will be undertaken when more imagery is available, but given it's location, an Earth directed component is likely.

Solar Wind / Geomagnetic Activity: Solar wind parameters were indicative of waning coronal mass ejection magnetic cloud conditions, with perhaps up to two embedded weak transients. Solar wind speeds were slow-ambient to slightly elevated. The Interplanetary Magnetic Field was initially moderate, starting around 13nT before easing back to weak after 13/2100 UTC. The north-south component, Bz, started positive, became moderately negative between 13/1745-14/0200 UTC before becoming mostly weakly positive thereafter. Geomagnetic activity ranged between Quiet to Active levels (Kp 1-4).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate to High solar activity is forecast, with Moderate-class flares expected and a chance of an isolated Strong-class flare.

Solar Wind /Geomagnetic Activity: No Earth directed coronal mass ejections currently feature in the forecast period, though a possible coronal mass ejection associated with the X1.1 flare at 14/0641 UTC is slowly appearing on imagery. Analysis of this feature will be undertaken when more imagery is available. Otherwise, there are no significant solar wind enhancements expected in the period, with solar winds remaining slow-ambient or perhaps slightly elevated at times.

Geomagnetic activity should remain Quiet to Unsettled (Kp 0-3) with a chance of Active (Kp 4) intervals, barring any coronal mass ejection arrivals.

Energetic Particles / Solar Radiation: A heightened risk of flare activity brings a chance of reaching or exceeding Minor Radiation Storm levels should any significant flares occur, although

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this risk reducing slightly through the period.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	15	10	5	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	80	80	80	80
Very Active	R3 to R5 X	No	30	25	25	25

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	30	20	20	20
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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